

Application No. 10/586,631
Reply to Office Action of January 5, 2009

DISCUSSION OF THE AMENDMENT

Claim 12 has been amended to depend on Claim 10.

New Claims 15-25 have been added, and are supported by the original Claims 4-14, respectively.

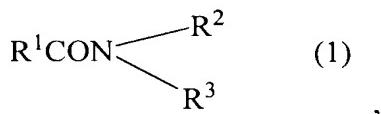
No new matter is believed to have been added by the above amendment. Claims 1-25 are now pending in the application.

REMARKS

Due to the length of the specification herein, Applicants will cite to the paragraph number of the published patent application (PG Pub) of the present application, i.e., US 2007/0154340, when discussing the application description, rather than to page and line of the specification as filed.

The rejection of Claims 1-5 under 35 U.S.C. § 103(a) as unpatentable over US 5,952,274 (Rieckert et al), is respectfully traversed.

The present invention, drawn to a lubricant for powder metallurgy, comprises a polyhydroxycarboxylic acid amide of the following formula (1):



wherein R² represents a hydrocarbon group having from 8 to 30 carbon atoms, R³ represents a hydrogen atom or a hydrocarbon group having from 1 to 30 carbon atoms), and R¹ represents either an alkyl group having from 2 to 10 carbon atoms and substituted with plural hydroxyl groups (Claim 1) or an alkyl group substituted with plural hydroxyl groups, provided that the number of carbon atoms constituting the alkyl group is an integer selected from a range of from n to 5 × n, in which n indicates the number of the substituted hydroxyl groups (Claim 2).

Rieckert et al, on the other hand, discloses polyhydroxycarboxyl amides that, contrary to the finding by the Examiner, does not “broadly [teach]” polyhydroxycarboxyl amides with an R² hydrocarbon group of from 8 to 30 carbon atoms. Indeed, the only polyhydroxycarboxyl amides disclosed by Rieckert et al have a group corresponding to presently-recited R² of 1 to 4 carbon atoms, i.e., “in particular alkylamides and dialkylamides with alkyl radicals having 1 to 4 C atoms (column 2, lines 3-4), N, N-dimethylgluconamide (column 2, line 11) and N,N-dimethylglucoheptonamide” (column 2, line 14). Rieckert et al

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neither discloses nor suggests polyhydroxycarboxyl amides containing a group corresponding to the presently-recited R² group having a minimum of eight carbon atoms.

The significance of the R² group having a minimum of 8 carbon atoms is demonstrated by the Experimental Examples in the specification. Experimental Examples 2 to 6 and 8 to 12 are according to the invention; Experimental Examples 1 and 7 are comparative examples, since the R² group has less than the 8 carbon atom minimum. As described in the specification at paragraph [0114], flowability (critical flow diameter) and lubricity (take-out pressure) suffer when the R² group is too short. Fig. 1 graphically shows these results. See Tables 1 and 2.

In addition, Rieckert et al's polyhydroxycarboxyl amides are not disclosed as a lubricant for powder metallurgy. Rather, it is clear from Rieckert et al's disclosure of their amides as extreme pressure (EP) additives for such vehicles such as lubricants, metal working fluids and hydraulic fluids (column 1, lines 57-61) that their polyhydroxycarboxyl amides are intended for use in a fluid, not in powder metallurgy.

For all the above reasons, it is respectfully requested that this rejection be withdrawn.

The rejection of Claims 6, 7 and 9-14 under 35 U.S.C. § 103(a) as unpatentable over Rieckert et al in view of WO 95/33589 (Storström et al), is respectfully traversed.

While, as the Examiner indicates, a use preamble, is not given patentable weight, the particular use disclosed by Rieckert et al is relevant when combined with another reference having a different use. Thus, while Storström et al discloses a lubricant for powder metallurgy, the Examiner has provided no nexus for lubricants intended for powder metallurgy and other types of lubricants such as for metal working fluids. Nevertheless, even if Storström et al (which was designated as an "A" reference in the International Search Report for the international application corresponding to the present application, i.e., not

particularly relevant) were combined with Rieckert et al, it would not remedy the above-discussed deficiencies in Rieckert et al.

In addition, Experimental Examples 15 to 22 in the specification demonstrate patentability for Claim 7 and claims dependent thereon, which shows further improvement in flowability and lubricity when an auxiliary lubricant is added, as described in the specification at paragraphs [0115]-[0118]. See Tables 1, 2 and 3. Experimental Examples 15, 16, 18 and 19 are particularly relevant to Claim 9. Experimental Examples 20-22 are particularly relevant to Claim 10 and claims dependent thereon.

For all the above reasons, it is respectfully requested that this rejection be withdrawn.

The rejection of Claim 8 under 35 U.S.C. § 103(a) as unpatentable over Rieckert et al in view of Storström et al, and further in view of US 6,323,159 (Raza), is respectfully traversed. The disclosures and deficiencies in the combination of Rieckert et al and Storström et al have been discussed above. Raza does not remedy these deficiencies. Raza has been relied on for a disclosure of a particular amide. Raza is drawn to a product and process for minimizing friction between relatively moving surfaces, the product including thermoplastic urethane containing an intimately interspersed additive that is capable of continually migrating outwardly from the surface of the product to provide lubrication at the interface between surfaces of the product and a surface of a relatively movable adjacent object (column 1, lines 5-15), wherein the additive is such an amide (paragraph bridging columns 1 and 2). The type of lubrication disclosed by Raza would appear to be different from the lubricant for powder metallurgy of Storström et al and the fluid lubrication of Rieckert et al. Nevertheless, even if the amide of Raza were used in the combination of Rieckert et al and Storström et al, the result would still not be the presently-claimed invention. Accordingly, it is respectfully requested that this rejection be withdrawn.

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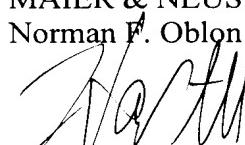
The objection to Claims 9 and 12, in the recital of the term “less than 100/0”, is respectfully traversed. By “less than 100/0”, Applicants mean a ratio in which the numerator and denominator add up to 100, but the numerator is less than 100 and the denominator is greater than 0, such as 95/5, as supported in the specification at page 32, lines 3-4. Contrary to the Examiner’s interpretation, a ratio of 100/0 would exclude the presence of the auxiliary lubricant, clearly not intended. Since an Applicant is entitled to be his own lexicographer, and since it is respectfully submitted that the above-quoted term would be understood by persons skilled in the art, it is respectfully requested that the objection be withdrawn.

Applicants respectfully submit that all of the presently-pending claims in this application are now in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.

Norman F. Oblon



Harris A. Pitlick
Registration No. 38,779

Customer Number

22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 08/07)